

Plant Allies for Central Texas Gardens Marjory

November 24, 2008

The initial impetus for our research was to find a plant that would act as 'living shade cloth' for the garden. We discovered two species of plants that perform that function well, along with many other benefits. This paper presents an overview of our findings to date.

The Central Texas weather during the late summer months of July, August, and September is extremely hot and often dry. Gardening during these months is challenging to say the least. Many gardeners and commercial organic farmers use shade cloth during these months. Some farmers and gardeners do very tedious work of covering the plants during the heat of the day, and removing the shade cloth during morning and afternoon hours.

A living alternative in the form of fast-growing, small, deciduous trees is presented here. Two species have been used in our research garden and have performed very well; leuceana and moringa. These trees provide a dappled shade. They were planted down the middle of rows oriented north/south which allowed sunlight during morning and afternoon hours, but a light shade during mid-day. We've experimented with several plant spacings and found that planting the trees 3' to 4' apart provided a good level of shading and sunlight. Plantings at 1' apart yielded too dense of shade. And plantings at 6' or greater yielded too little shade.

Both of these trees have many other benefits. All parts of the moringa tree are edible and/or medicinal. The leaves of moringa are highly nutritious and are used throughout the world to help alleviate malnutrition. Leuceana's young pods, leaves, and seeds are edible. Leuceana also is in the legume family and fixes nitrogen in the soil with its root system. In addition, these trees with their transpiration of water helped create a lush micro-climate in the garden and provided habitat for birds, butterflies, and other insects.

Both the leuceana and moringa are heat and drought tolerant.

Both of these trees are native to tropic climates and die back with the first freeze (typically mid-November here in Central Texas). This is good, as we do not want shading during the winter months. They do not start leafing

out and shading until early summer which is also a highly desirable timetable for gardens in Central Texas, as we want to maximize the sunlight in spring and early summer.

The dead trunks left behind in winter can be left in place making an easy structure to drape with protective coverings, or used as scaffolding for vining plants. The trunks can be used for firewood, or as they are very straight, for wood-working crafts. Some implementations use the trees to surround a garden and use the posts as a living fence.

Note that first year growth of the leuceana will yield negligible amounts of shade and forage. The second year growth is multi-stemmed and prolific.

2-year old leuceana plant growth:

June 1, 2008	4-5 feet high
July 1, 2008	5-6 feet high
August 1, 2008	6-7 feet high

Although edible for humans, we used the foliage and some stalks of the leuceana for rabbit feed. The leaves of leuceana are reported to have a protein content of 24%-27% (on a dry basis). Below is a chart showing the weight of leuceana harvested from a 14' row planted in our garden. The plants were spaced approximately 14" apart. In the chart 'L1' refers to the first plant in the row, 'L2' refers to the second plant, 'other' refers to the remaining plants in the row, and total is the sum of all of the harvest. Whenever the plants reached 8' to 10' tall we cropped them back to a 5' or 6' level.

	L1 (lbs)	L2 (lbs)	Others (lbs)	Total (lbs)
8/21/08	3.0	3.25	5.5 lb.	11.75
8/31/08			7.0	7.0
9/3/08			2.5	2.5
9/18/08	2.5	1.0	3.0	6.5
9/21/08			4.0	4.0
10/16/08	2.0	1.5	10.5	14.0
11/2/08	1.25	0.25	6.5	8.0
11/15/08	1.5	1.25	5.0	7.75
TOTALS	10.25	7.25	44.0	61.5

L1, and L2 were at the southern most end of the row and were bigger due to greater access to sunlight and greater room to grow. The plants were watered approximately weekly, with additional watering by rainfall at less than 1" per month.

We used approximately ½ to 1 lb. of leuceana leaves and stems as food for one rabbit for one day (along with free access to hay). This provided a high-protein, fresh green meal during a time when fresh greens were scarce. The specific amounts needed per rabbit, and the number of trees needed to support a rabbit is an area that needs further research.

The moringa is not as prolific as leuceana. The harvested moringa leaves were dried and used for tea and nutritional powder boosts for soups and stews for human consumption.

Both the moringa and leuceana trees we used were started in a green house in early spring. We found the leuceana more difficult to propagate than morninga. Our seeds were purchased from ECHO Seeds in Florida, and some were gifts from World Hunger Relief Inc. There are many varieties of both leuceana and morninga, and more research on the best variety for various soil types is needed. Note that the Texas native leuceana, the 'Lead Ball Tree', is considered too slow growing and not as palatable as other developed varieties.

Underneath our leuceana we grew chard, which lasted significantly longer than would be expected without shading. Our focus in these early years has been to determine the best plants to use for shading; future research will focus on which crops underneath these trees are best for production of human food.

Both moringa and leuceana are highly researched plants and used extensively in third world countries. Much information regarding propagation and culture is available via the internet and printed material. The model for our garden using leuceana, rabbits, and annual vegetables is described in detail in the World Hunger Relief Inc. training manual titled "Backyard Food Production Systems".

Deep appreciation is extended to Matt Hess of World Hunger Relief Inc., and to Dr. Lukefahr of Texas A&M for their assistance.



Leuceana in August 2008. Plants in second year of growth. Spacing is approximately 12" to 14".



Leuceana plants in December 2008.